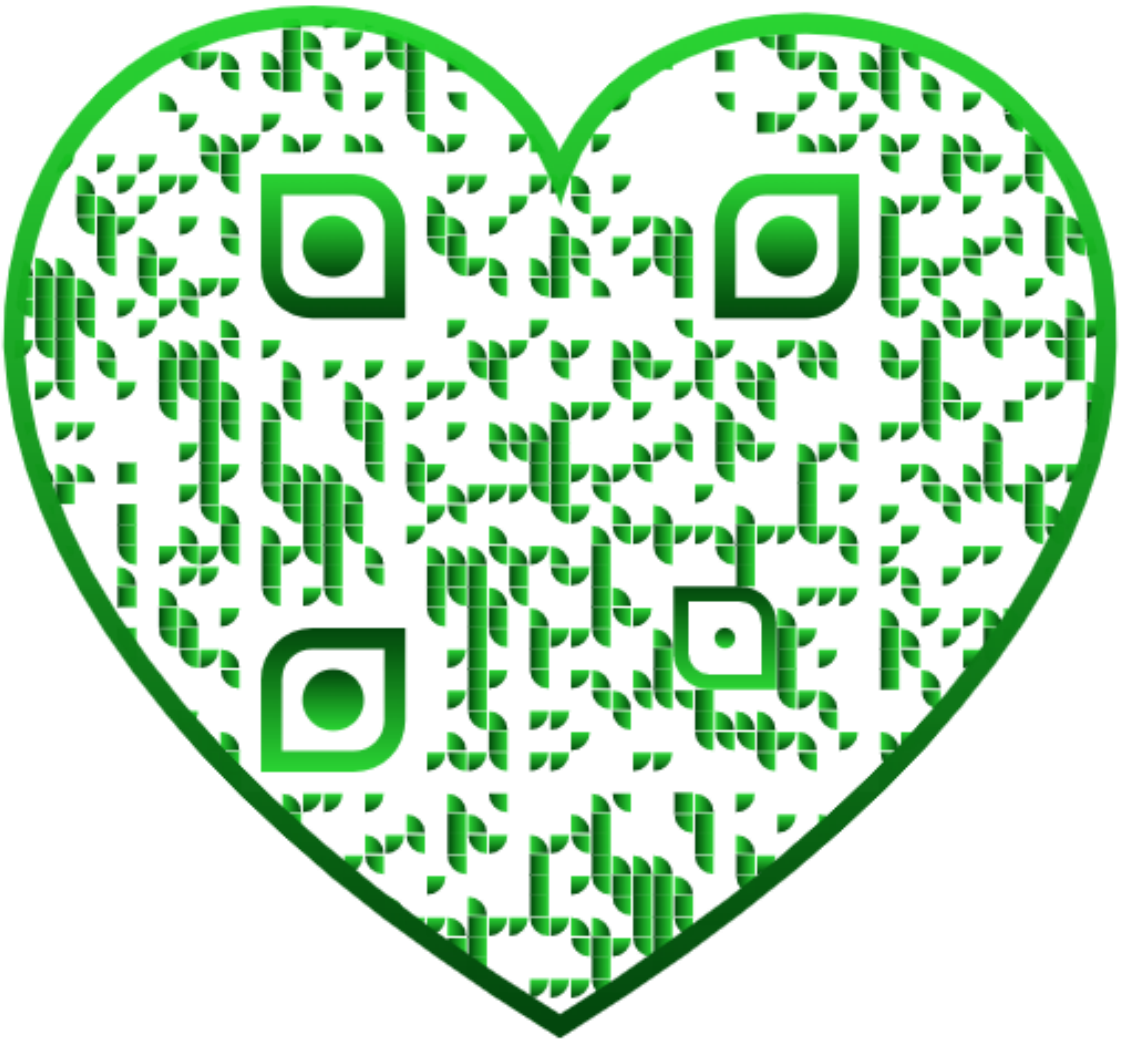
Drug Distribution and Use

Sisay E.



Learning Objectives

- At the end of this session, students will be able to:
  - Describe main goals of drug distribution cycle
  - Identify the major elements of distribution system
  - Identify steps used in re/design distribution system & examine each steps
  - Illustrate the distribution system of Ethiopia

Introduction

- **Distribution:**
  - Consists of moving products down the pipeline from the national central warehouse until they are dispensed to the final customers
  - The procuring, purchasing, holding, storing, selling, supplying, importing, exporting, or movement of pharmaceutical products, with the exception of the dispensing or providing pharmaceutical products directly to a patient or his or her agent

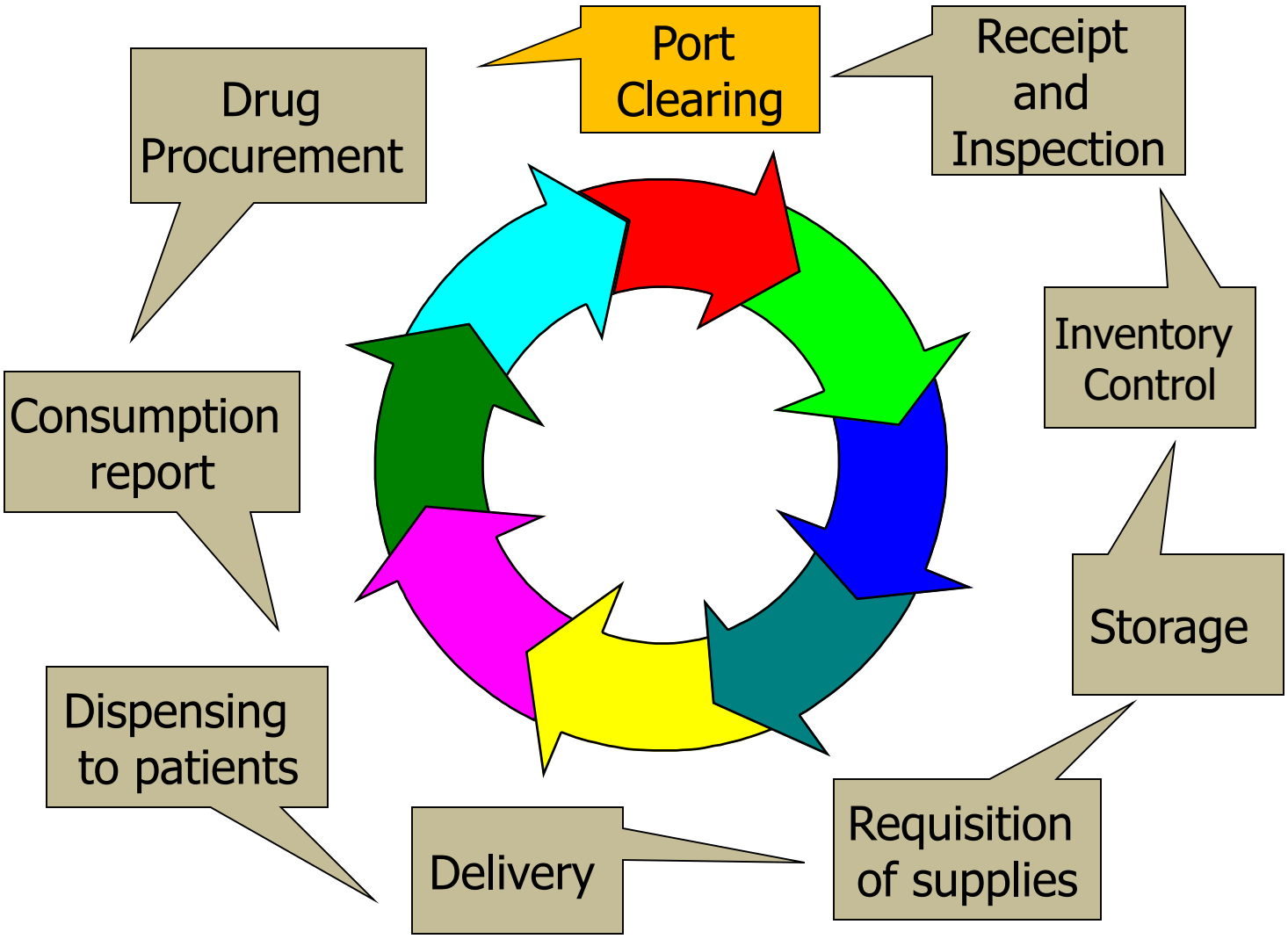
Goals of Distribution Management

- Maintain **continuous supply** of drugs
- Keep drugs in **good condition** throughout distribution process
- Adequate **geographic** coverage
- Minimize drug **losses**
- **Control/reduce** theft and corruption

Goals of Distribution ….

- Rationalize drug **storage** points
- Efficient **transport** /delivery
- To keep accurate inventory **records**
- Provide **information** for forecasting medicine needs

The Distribution Cycle



Transportation network design

- ***Transport Management System (TMS)***
  - Just designing a transport network and allocating resources will not guarantee a well-functioning system
  - Development and implementation of a formal TMS will support and sustain a successful distribution network

Transportation network design…

- A comprehensive TMS should include the following activities, which will impact the transport of health products:
  - **Operations management:**
    - To ensure that transportation practices are aligned with policy, include
      - Scheduled delivery planning,
      - Vehicle allocation
      - Control over fuel consumption, and
      - Monitoring of performance in this activity.
  - **Fleet management**
    - Transport vehicles are an expensive, yet essential, component of health product delivery.
    - To guarantee vehicle availability and good working conditions, you must monitor the proper use of vehicles and plan for their preventive maintenance and eventual replacement and disposal.

Transportation network design…

- **Human resources**.
  - It is important that you ensure the availability of a well-trained operator for each vehicle, as well as a designated transport manager at every facility that provides transportation services.
- **Performance monitoring and costs.**
  - To monitor and control effective transport operations, it is essential that you define and apply key performance indicators (KPIs).
  - For better resource planning, you should also include a complete set of indicators in the collection of all operational costs.

Transportation network design…

- Quality monitoring of storage and distribution includes collection of data, as well as supervision and feedback. you can use a WMS to collect information about:
  - Stock availability
  - Order fulfillment
  - Inventory accuracy
  - Space utilization
  - Safety

Distribution System Design

- Four major elements of distribution system:
  - ☞System design
  - ☞Information system
  - ☞Storage
  - ☞Delivery

Steps in designing/redesigning distribution system

1. Determine the number of storage levels in the system
    i. Geographical factors
    ii. Population
    iii. Staff
    iv. Transport facilities and other resource constraints
2. Determine the location of storage sites
    i. Map the demand for drugs
    ii. Locate supply entry points
    iii. Select primary storage points
    iv. Plan primary distribution routes and locate intermediate stores
    v. Plan secondary distribution routes

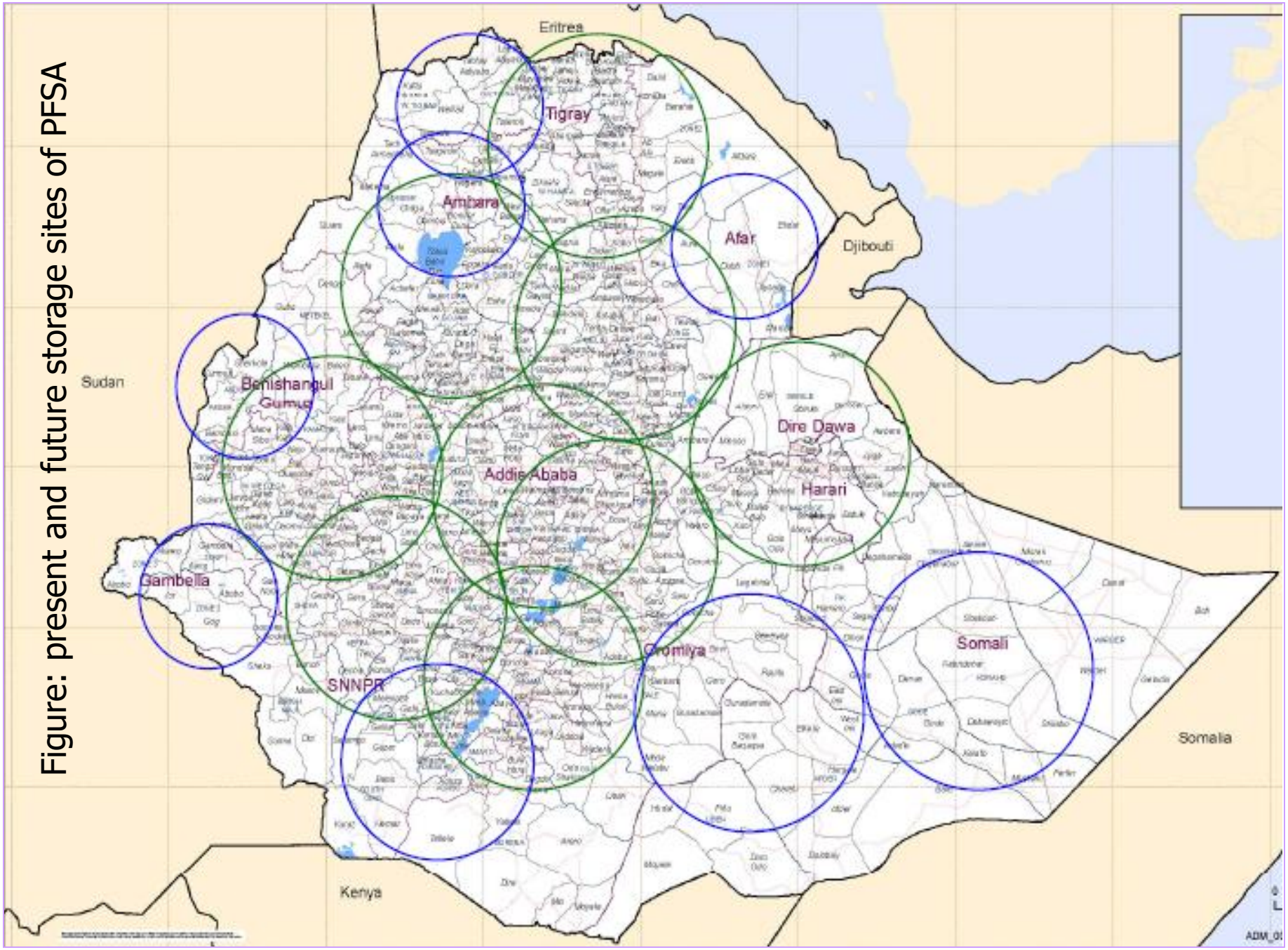
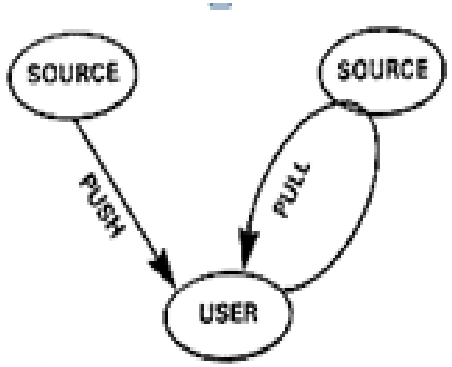


Figure: present and future storage sites of PFSA
Eritrea
Tigray
Amhara
Afar
Djibouti
Sudan
Benishangul
Gumuz
Dire Dawa
Addis Ababa
Harari
Gambella
Oromiya
Somali
SNNPR
Somalia
Kenya

System Design…

3. Decide at which level of the supply system decisions will be made concerning orders

→ **Pull system:** Independent demand or requisition system



→ **Push system:** Allocation or ration system

4. Fix re-supply intervals or frequency of placing orders

System Design…

5. Select a method for distributing drugs to user units

→ Collection Vs. Delivery system

System	Advantages	Disadvantages
Delivery	• Total cost less if all in place • Can be combined with other visits • Drug selection and packing can be accomplished efficiently	• Need reliable transport facilities • Possibility of breakage and loss of quality if the delivery route is long • Security lapses may occur due to lack of responsible officer • Health facility may be closed when delivery truck arrives • The delivery truck may be in a hurry to get to the next destination making it difficult to check for short shipments, damage

System Design…

System	Advantages	Disadvantages
Collection	●Meet people from field and discuss problems ●Free CMS staff from providing transport to field ●Allow field personnel to attend to other business in town??? ●Offers possibility of greater choice of methods of transport ●Allow for better checking, handling and security of goods received	●Takes up a lot of health facility time ●Time may be wasted while waiting for supplies ●Health centre personnel may tend to increase the frequency of visits for various reasons

System Design…

6. Determine amount of inventory to be held at each level in the system
7. Develop a set of feasible & economical delivery routes
8. Select an appropriate mode of transport

6. Estimate operating costs and assess the cost-effectiveness

Understanding the context

ETHIOPIA ???

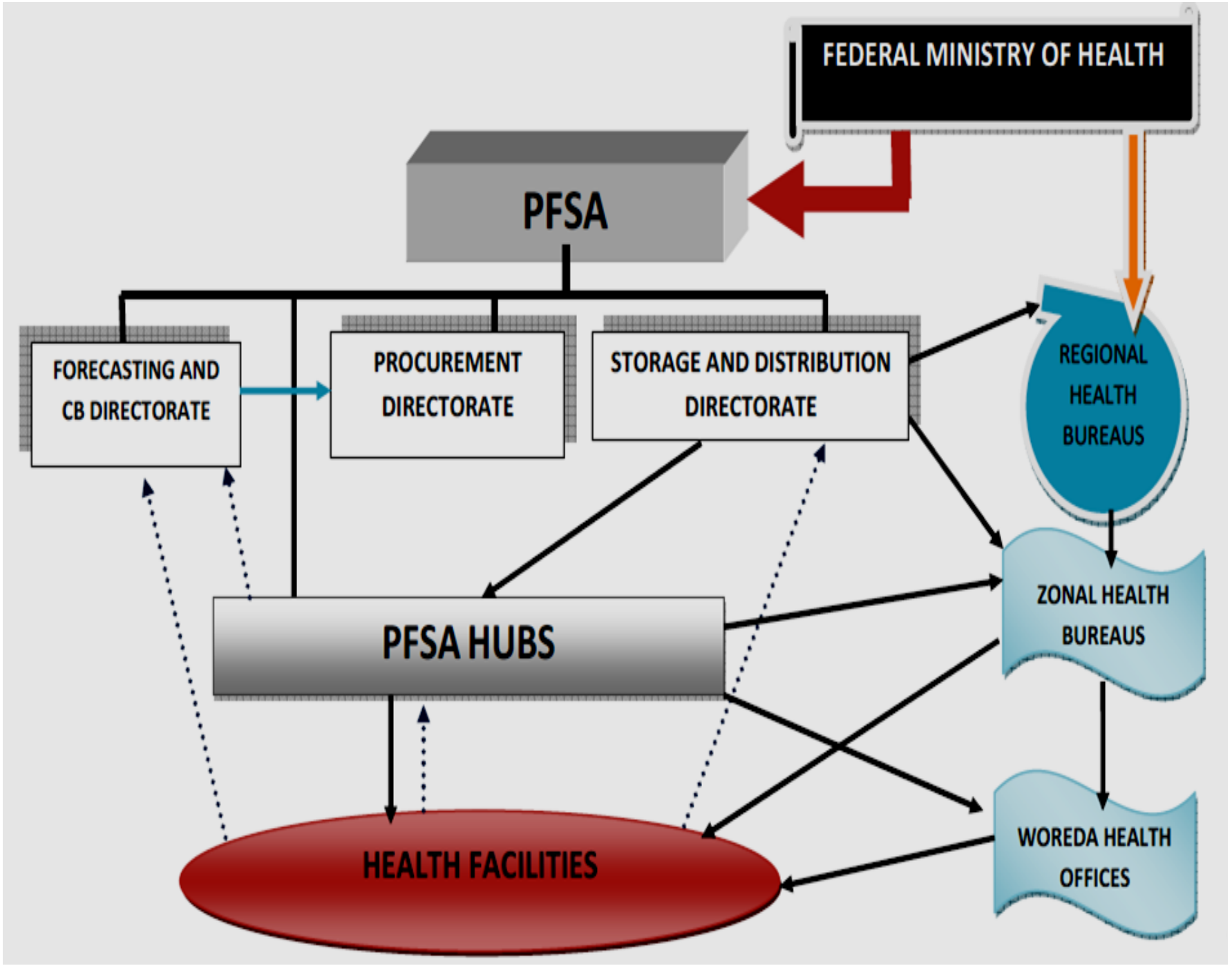
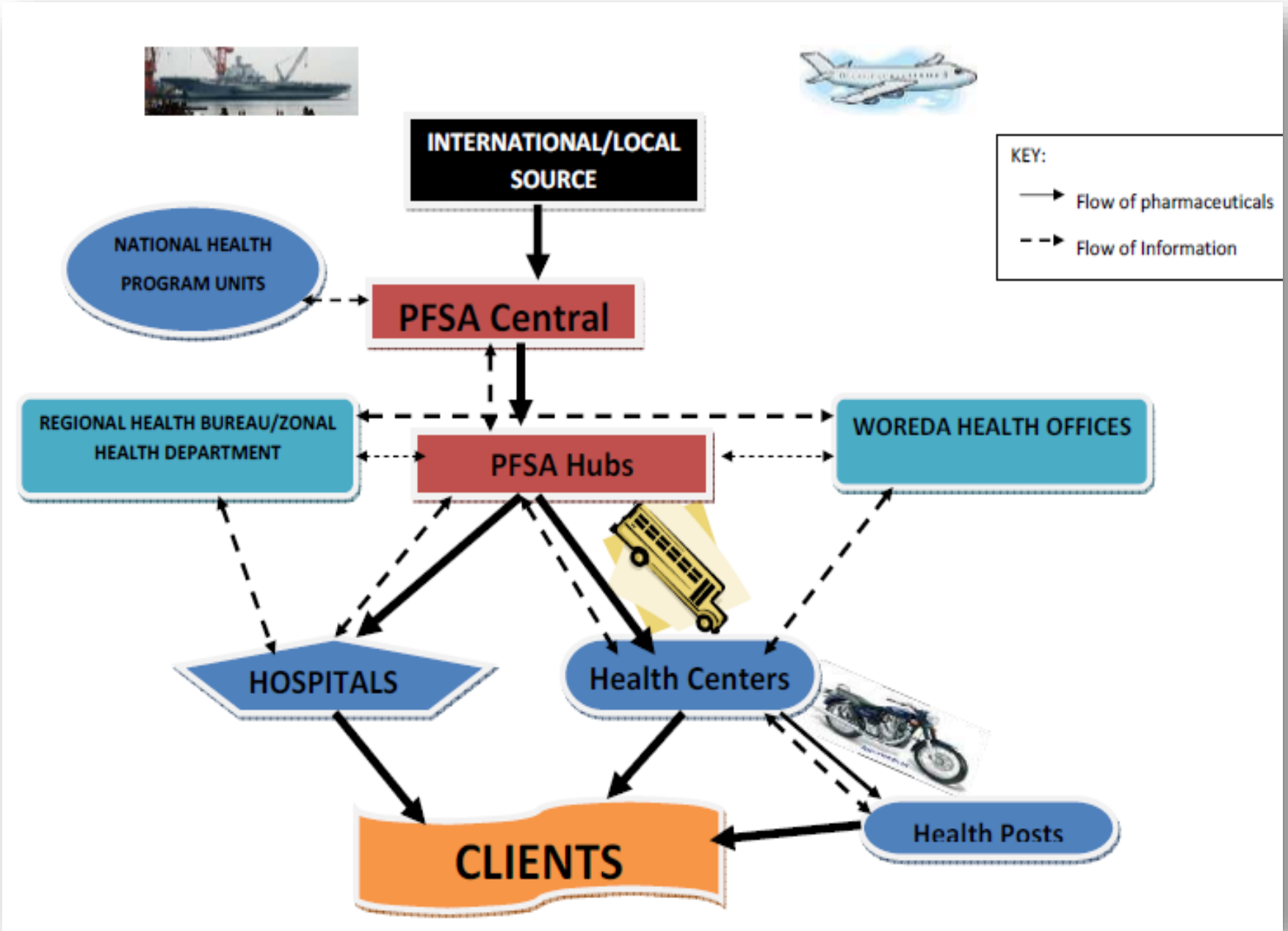

FEDERAL MINISTRY OF HEALTH
PFSA
FORECASTING AND CB DIRECTORATE
PROCUREMENT DIRECTORATE
STORAGE AND DISTRIBUTION DIRECTORATE
REGIONAL HEALTH BUREAUS
ZONAL HEALTH BUREAUS
PFSA HUBS
WOREDA HEALTH OFFICES
HEALTH FACILITIES

Figure: Flow of Pharmaceuticals and Information in the IPLS of Ethiopia



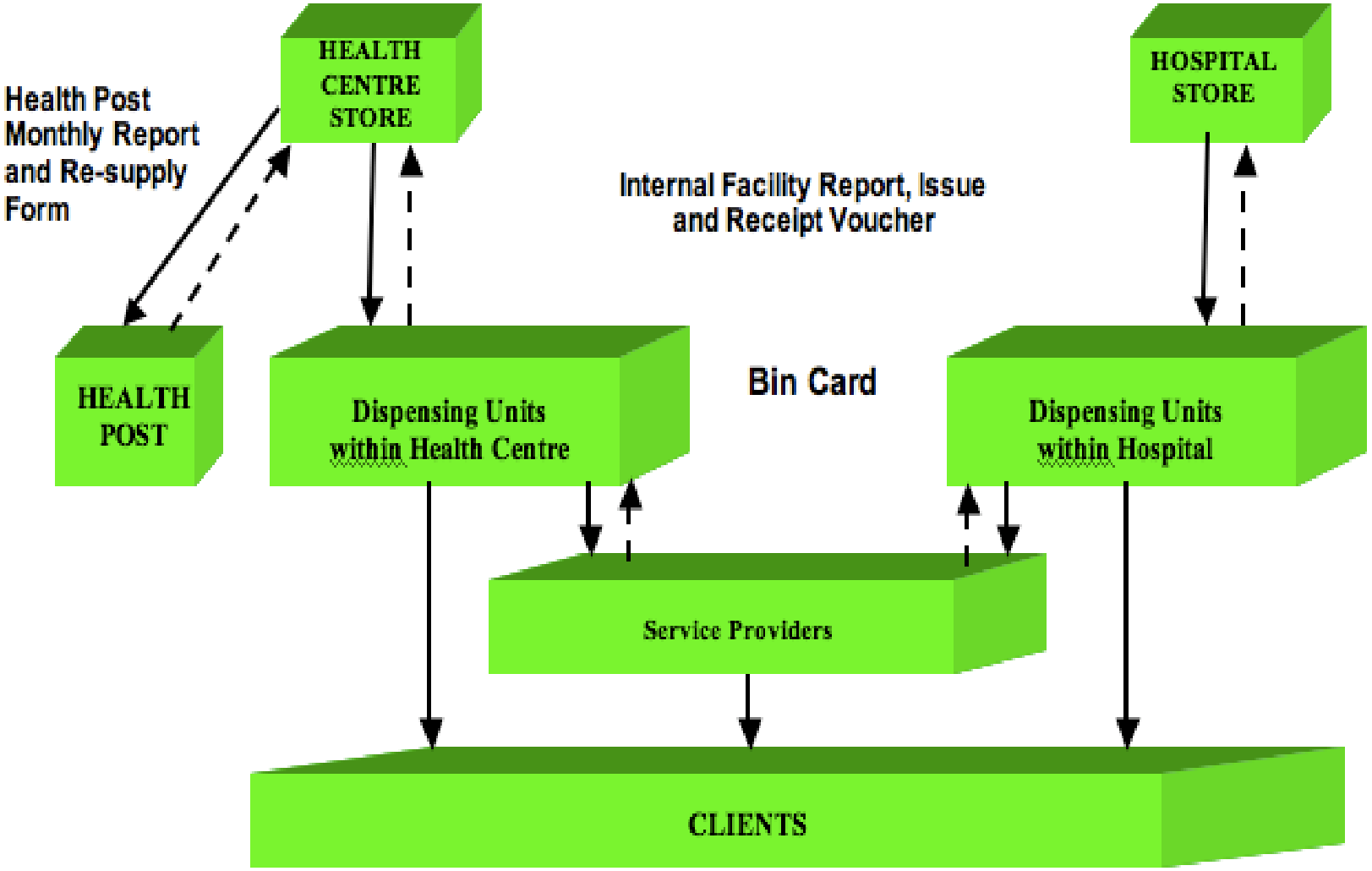


Figure: Movement of Products and Information b/n HCs and HPs and b/n Facilities and Internal Dispensing Units

Drug Use

Drug use

- Drug use is the process of prescribing, dispensing and patient use.

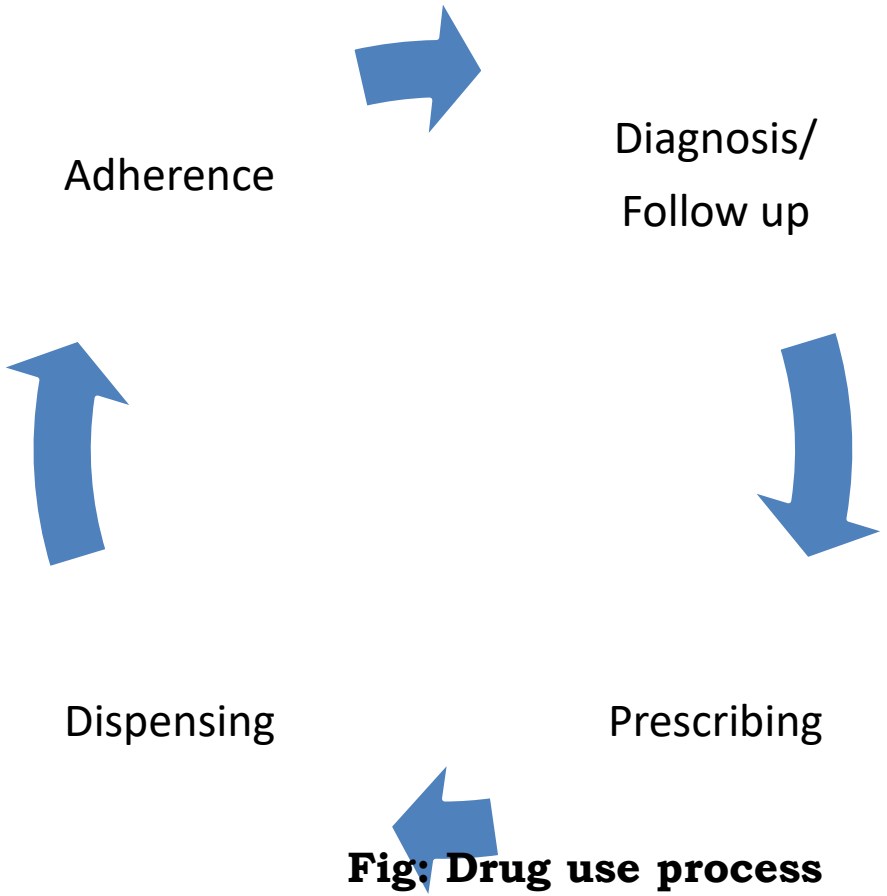


Fig: Drug use process

Drug use…

- The rational use of drugs requires that patients receive:
  - Medications appropriate to their clinical needs
  - In doses that meet their own individual requirements
  - For an adequate period of time
  - At the lowest cost to them and to their community
- **Rational drug use (RDU) involves**
  - Appropriate indication
  - Appropriate drug
  - Appropriate dosage regimen
  - Appropriate patient
  - Correct dispensing
  - Patient adherence

Drug use…

- **Rational use of drugs**
  - Complex issue demanding mainly an integrated action of drug prescribers, dispensers and users and/or patients.
  - It may even extend to the level of health administrators and policy makers,
    - For instance, in matters related to the development of a list of essential drugs and improvement of the availability of drugs.
  - Dispensing practice, the duty of dispensers, plays a central role in the provision of rational drug therapy

Drug use…

- **Rational Prescribing**
- **Requires:**
  - Making accurate diagnosis
  - Deciding whether or not the diagnosis requires drug treatment
  - Selecting the best drug among available
  - Prescribing in accordance with the standard course of treatment
  - Following correct prescription writing
  - Counseling the patient
- *Roles of pharmacy professionals in promoting rational prescribing?*

Drug use…

- **Rational dispensing**
  - Dispensing refers to the process of preparing drugs and distributing them to their users with provision of appropriate information.
  - It may be based on a prescription or an oral request of users (patients or care providers) depending on the type of drugs to be dispensed.
  - Dispensing includes all the activities that occur between the time the prescription or oral request of the patient or care provider is presented and the drug or other items are issued to them

Drug use…

- Good dispensing practices ensure that the correct drug is delivered to the right patient, in the required dosage and quantities, with clear instructions, and in package that maintains an acceptable potency and quality of the drug.
- Quality of dispensing depends on:
  - Training of professionals
  - Resources (time, premise set up, dispensing materials and equipment
  - Communication skill
  - Level of adherence to code of ethics

Drug use…

- **Appropriate patient use**
  - Proper handling of medications
  - Adherence to treatment
- **Irrational drug use**
  - Is the use of medicines in a way that is not compliant with rational use

Drug use…

- **Common types of irrational use:**
  - Use of drug when not needed
  - Use of too many drugs (polypharmacy)
  - Inappropriate use of antibiotics
  - Over-use of injections
  - Under-dosing/overdosing
  - Overuse of relatively safe medicines
  - Use of non-essential combination drugs
  - Use of needlessly expensive medicines
  - Medicine use not in the way intended by prescriber/dispenser
  - Self-medication with prescription only medicines
  - Unsafe use of herbal medicines

Drug use…

- **Impact of irrational drug use**
  - Decrease in quality of health care
  - Impact on cost
  - Psychosocial impact
- **Factors underlying irrational drug use**

  1. Health care provider (prescriber and dispenser)
    - Inadequate pre-service training
    - Lack of continuing education
    - Financial interest
    - Lack of role models who practice rationally
    - Patient load and pressure on treatment choice
    - Unethical promotional activities by pharmaceutical companies

Drug use…

2. Health system

- **The pharmaceutical supply system and availability of facilities**
  - Unreliable supplies
  - Poor quantification and forecasting
  - Inadequate inventory management
  - Inadequate distribution system
  - Inefficient management of the procurement process
  - Lack of adequate laboratory facilities
  - Lack of facilities for dispensing

Drug use…

- **Legal and regulatory framework**
  - Non-formal prescribers/dispensers
  - Out of date or no-existent standard treatment guideline (STG), drug list, formulary…
  - No DTC encouragement
  - No pharmacovigilance program
  - Inadequate medicine registration and quality assurance system
  - Lack of system for continuing medical education
  - Lack of financing and reimbursement mechanisms
  - Lack of regulation on drug promotion
  - Even in the presence of regulations, there may be lack of enforcement

Drug use…

- **3. Patient/client and community**
  - Perceived need for medicines
  - Perceived need for consulting health workers
  - Ideas about efficacy and safety
  - Uncertainty resulting in poly-therapy
  - Cost of medicines
  - Absence of social support
  - Inability to take time off work
  - Low literacy level
  - Medicine use culture
  - Medicine supply system
  - Quality of prescribing and dispensing
  - Therapy-related factors (route of administration, treatment complexity, duration of treatment, side effect, taste of medication…)

Drug use…

- **Stepwise approach for promotion of rational drug use**
  - Assess current patterns of drug use, identify any problem and recognize the need for action
  - Identify underlying causes and motivating factors
  - List possible interventions
  - Assess resources available for action
  - Choose and carryout interventions
  - Monitor the impact and restructure the intervention

Drug use…

- **Interventions/strategies to improve drug use**
  - They can be classified in to three major strategies:
    - Educational
    - Regulatory
    - Managerial
- **Educational:**
  - Is intended to persuade individuals by providing information
  - It may include training, provision of printed materials and education

Drug use…

- **Managerial**
  - Is used to guide action (decision making)
  - **Example:**
    - Drug list, STG
    - Drug utilization review and feedback
- **Regulatory**
  - Aimed to enforce decisions
  - **Example:**
    - Drug registration regulation
    - Generic policy
    - Prescribing and dispensing restrictions
    - Level of use restrictions

Drug use…

- **Characteristics of effective interventions:**
  - Identify key influence factors
  - Target individuals or groups with the worst practice
  - Use credible information sources
  - Use credible communication channels
  - Use personal contact whenever possible
  - Limit the number of messages using different media
  - Provide better alternatives